

ABSTRACT

A cured resin dissolving composition comprising an alkyl ammonium fluoride dissolved in a wide variety of solvents and co-solvents with a soluble amine and surfactant. The composition is ionized to release fluoride which penetrates and reacts with the cured resin causing bond cleavage, breakdown, and dissolution of polymeric structure. The solvent system may be composed of hydrophilic solvents such as amides, ketones, alcohols, esters, and ethers, as well as hydrophobic families such as alkanes, alkenes, halogenated hydrocarbons, and aromatic hydrocarbons of varying carbon chain length and molecular weight. The rate of reactivity of polymer breakdown is concentration dependent upon ionized fluoride, stimulated by solution polarity and upon the amine triggered release from the organo-fluoride. This rate is determined to be optimum in hydrophilic solvent systems with an amine. The product may be used in manufacturing to remove unwanted cured resins and their residues. Using such a hydrophilic solvent system, the formulation can be easily rinsed with water, an alcohol, or another hydrophilic rinse. When used in a hydrophobic system, rinsing is achieved with a surfactanted pre-rinse, alcohol, or another compatible solvent. By choosing between the philic and phobic formulations, selectivity towards silicone polymer may be exercised over the presence of other polymers. The formulations are safe for a wide range of metals allowing broad use in manufacturing for a wide range of applications in various industries. Hydrophilic formulations may also be used to breakdown and remove cured polymers other than silicones which include acrylic, epoxy, and novolak systems. In such cases, exposure times and conditions will vary depending upon the extent of curing. The invention has application in a wide range of industries where removal of cured resin is desired either in processing parts or for re-working. Examples of electronic industry applications include removing silicone conformal coatings, adhesives, potting compounds; applications in aerospace include removing sealant fillets during etching and machining of jet engine parts, dissolving sealant and residue from acrylic surfaces.